REMARKS

This is intended as a full and complete response to the Restriction Requirement dated November 20, 2002, having a shortened statutory period for response set to expire on December 20, 2002. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-24 are pending in the application and are subject to restriction and/or election requirement.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-15, drawn to a method, classified in class 427, subclass 248.1.

II. Claims 16-22, drawn to a film, classified in class 428, subclass 411.1+.

III. Claims 23 and 24, drawn to an apparatus, classified in class 118, subclass 715.

Applicants elect Group I, claims 1-15 with traverse. Applicants have canceled claims 23 and 24. Applicants have amended claims 1 and 16 to more clearly illustrate the claimed subject matter. Applicants have amended claim 22 as to matters of form. Applicants submit that the changes made herein do not introduce new matter and are supported by the specification.

As amended, claim 16 of Group II recites a film deposited by the process of claim 1. The films of claim 16 could not be made by a process different than claim 1 since claim 16 as amended now recites the same process as claim 1 as amended. Thus, Applicants submit that the process of Group I and the product of Group II should not be restricted. Applicants respectfully request withdrawal of the restriction of Groups I and II.

Applicants have amended the specification to correct matters of form. Applicants submit that the changes made herein do not introduce new matter. Applicants are also submitting a proposed drawing amendment in a separate paper. A marked up copy of the drawings showing the proposed changes marked in red is attached.

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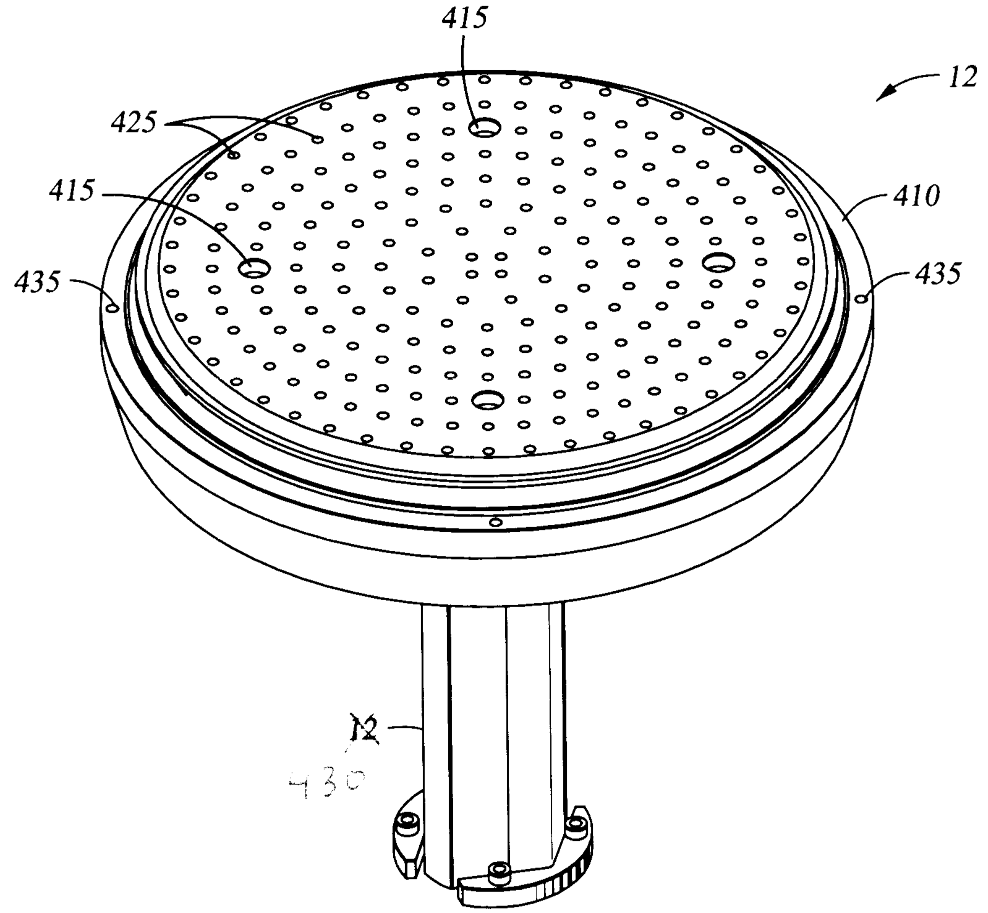

Fig. 3

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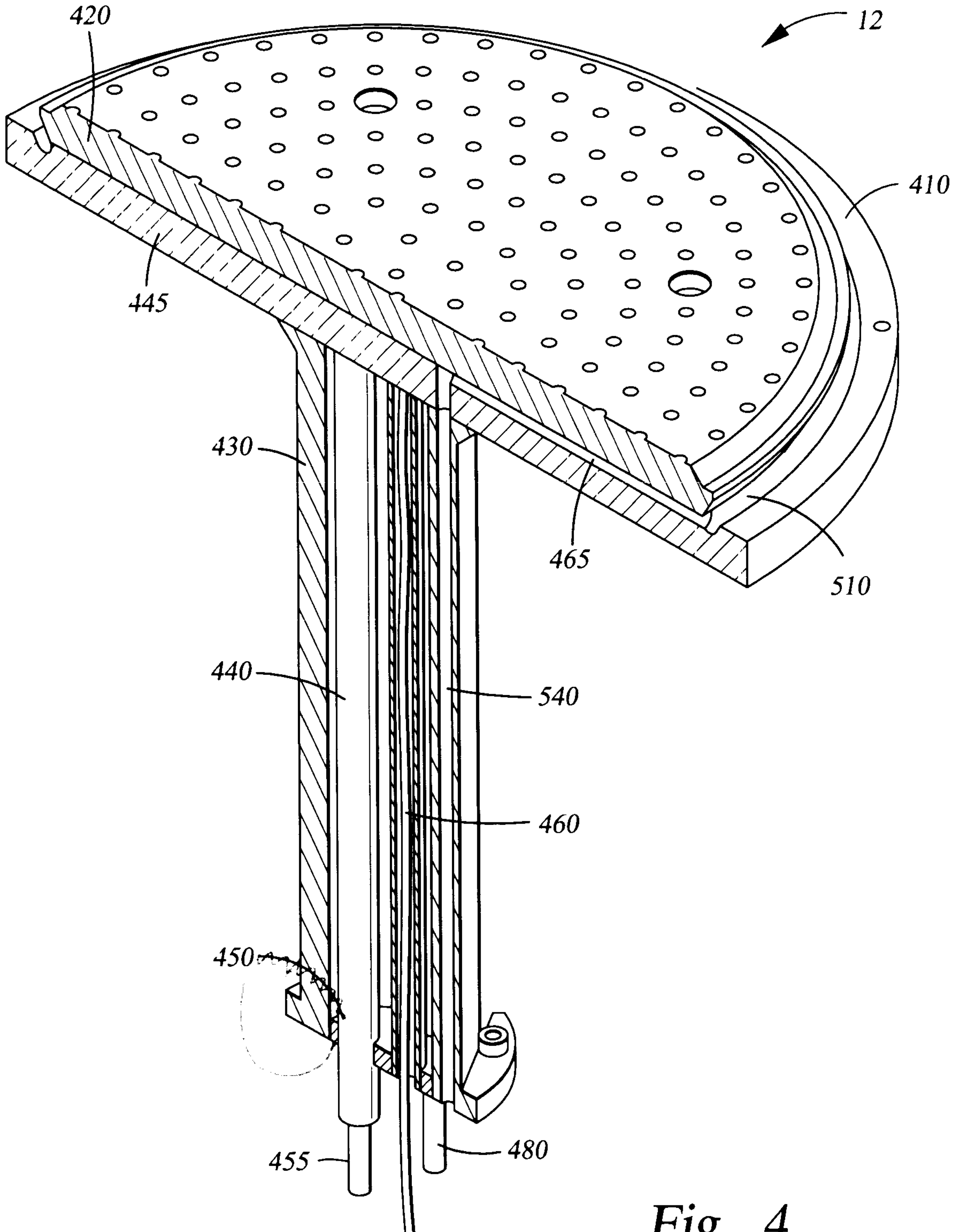

Fig. 4

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please replace paragraph [0042] with the following paragraph:

[0042] Figure 3 is a top view of a susceptor 12 according to one embodiment of the invention. The susceptor 12 generally includes a substrate support 410 and a shaft 430. The substrate support 410 is comprised of a first (upper) plate 420 and a second (lower) plate 445 (shown in Figures 4 and 5) having a slightly larger diameter than the upper plate 420. The substrate support 410 includes one or more alignment pin holes 435 disposed through an outer edge of the substrate support 410 to receive one or more alignment pins 550 (shown in Figure 5). The upper plate 420 supports a substrate during processing and has a surface area about equal to the [are] <u>area</u> of a substrate to be processed so that there is minimal overhang of the substrate around an edge of the upper plate 420. The lower plate 445 generally has a first side that is connected to the upper plate 420 and a second side that is connected to the shaft 430. The upper plate 420 and lower plate 445 are typically fused together, for example, by clamping the plates 420 and 445 together at an elevated temperature for a period of time, typically without a bonding agent. Alternatively, the plates may be coupled by sintering, adhesives, mechanical means (*i.e.*, fasteners), and the like. The upper plate 420 is fabricated from ceramic, such as aluminum nitride. Preferably, about 95 percent pure aluminum nitride is used to enhance the thermal conductivity of the upper plate 420.

Please replace paragraph [0043] with the following paragraph:

[0043] Figure 4 is a cross-sectional view of the susceptor 12 shown in Figure 3. The lower plate 445 is also fabricated from ceramic, such as aluminum nitride. Preferably, about 95 percent pure aluminum nitride is used to enhance the thermal conductivity of the lower plate 445. The lower plate 445 includes at least one heating element, such as an embedded RF electrode [490] <u>(not shown)</u>, connected to one or more electrode pins

455. One or more leads 460 extend through the second side of the lower plate 445. The leads 460 extend through the shaft 430 to an RF terminal 480 connected to the RF power source 25 for grounding the susceptor 12. The power source 25 supplies power to the electrode [490] to enable the substrate support 410 to heat a substrate to a temperature in the range of about 300°C to about 550°C. The lower plate 445 includes a vacuum passage [475] <u>(not shown)</u> which extends through the upper plate 420 to a plurality of vacuum ports 425 disposed in a top surface of the upper plate 420 for vacuum chucking a substrate to the support 410. Alternatively, the vacuum passage may be eliminated and the substrate held in place by surface friction or gravity. Additionally, the lower plate 445 includes a purge passage 540 and a plurality of lift pin passages 415 extending therethrough. The lift pin passages 415 are generally disposed radially outwards from the vacuum passage [475] and the purge passage 540. The lift pin passages 415 extend from the lower plate 445 through upper plate 420, exiting through the top surface of the upper plate 420.

Please replace paragraph [0046] with the following paragraph:

[0046] The shaft [230] <u>430</u> generally is fabricated from ceramic, such as aluminum nitride. Typically about 99 percent pure aluminum nitride is preferred to minimize thermal transfer between the substrate support 410 and shaft [230] <u>430</u>. The shaft [230] <u>430</u> is generally tubular in cross section. The shaft [230] <u>430</u> has an annular section that defines a central passage. A first projection and a second projection extend from the annular section. The first projection has a purge passage 540 and the second projection has a vacuum passage [475] respectively disposed therethrough. The thickness of the annular section and the walls of the first and second projections are selected to minimize thermal conductivity therethrough.

Please replace paragraph [0047] with the following paragraph:

[0047] The shaft has a first end and a second end. The first end is connected (*i.e.*, fused, bonded or sintered) to the second side of the lower plate 445. One or more

ceramic sleeves [440and] <u>440 and</u> pin retainers [450are] <u>450 are</u> disposed in the central passage of the shaft 430 and extend partially through the second end. [The sleeve 440 is disposed substantially around the pin retainer 450 to avoid current leakage between the electrode pins 455 and the] <u>The</u> pin retainer 450 holds the one or more sleeves 440 in place to avoid excessive stress on the pins 455.

Please replace paragraph [0050] with the following paragraph:

[0050] In step 630, <u>a</u> process gas mixture containing an oxidizer, such as oxygen or ozone (O_3), and/or a carrier gas, such as argon or helium, and a carbon silicon gas source, such as those listed above or a combination thereof, is supplied adjacent an edge of the substrate through purge gas inlet 510 of susceptor 12 at a flow rate of about 1 sccm to about 150 sccm, preferably about 100 sccm. In one aspect, it is contemplated that one or more carbon silicon gas sources may be used to advantage with the invention. The carbon silicon gas sources are supplied to the chamber through the manifold 11, or showerhead, and/or a purge gas inlet in the susceptor 12. In another aspect, it is contemplated that a self-oxidizing carbon silicon gas source eliminates the need for a separate oxidizer. In yet another aspect, it is contemplated that tetraetheyl orthosilicate (TEOS) may be delivered through the purge gas inlet in the susceptor 12 to increase the concentration of silicon oxide at the edge of the substrate.

<u>IN THE CLAIMS:</u>

Please cancel claims 23-24, and amend the claims as follows:

1. (Amended) A method for depositing a film on a substrate, comprising:

positioning a substrate in a chamber on a substrate support;

flowing a carrier gas into the chamber;

flowing a process gas mixture adjacent an edge of the substrate through a purge gas inlet in the substrate support;

generating a plasma;

delivering a first carbon silicon gas source to the chamber through another gas inlet; and

depositing a film on the substrate.

16. (Amended) A film produced by [the] a process[,] comprising:

positioning a substrate in a chamber on a substrate support;

flowing a carrier gas into the chamber [through a gas inlet];

flowing a process gas mixture adjacent an edge of the substrate through a purge gas inlet in the substrate support;

generating a plasma;

delivering a first carbon silicon gas source to the chamber through another gas inlet; and

depositing a film on the substrate.

22. (Amended) The [apparatus] film of claim 16, wherein the carrier gas and the first carbon silicon gas source are delivered to the chamber through a showerhead.